

CLAIMS

1. Machine for righting and aligning articles using drop chutes comprising multiple compartments, said articles (A) being of the type having a differentiated configuration (A1) at one end and a base (A2) at the other end, and said
5 machine being of the type comprising:

at least one drop chute (1) arranged under a housing (2) designed to receive from loading means an article (A) in a flat position, pre-orientated in the longitudinal direction and let it fall in this position into said drop chute (1):

end stop and support elements (3) associated with said housing (2) to
10 support said differentiated configuration (A1) of the article (A) as it falls so that it is introduced in the upright position in the drop chute (1), in other words, with said base (A2) at the lowest level;

a partition wall (4) that divides a lower part of the drop chute (1) into two compartments (5), and a first diverter plate (6), arranged in a hinged fashion on
15 an upper end of said partition wall (4) and actuated by actuating means to change position in order to direct the articles (A) that fall towards one and the other of said compartments (5), in an alternating manner; and

transfer means to transfer the articles (A) from said compartments (5) to exit transport means (7) in an aligned fashion;

20 characterised in that it comprises a pair of additional partition walls (8), each one arranged in the lower part of one of the compartments (5) dividing it into two subcompartments (5a) that are substantially equal, each one capable of housing an article (A) in the upright position, and a pair of second diverter plates (9), each one arranged in a hinged fashion on an upper end of one of said
25 additional partition walls (8) and actuated by actuating means to change position in order to direct the articles (A) that fall towards one and the other of said subcompartments (5a), in an alternating manner, whereby the drop chute (1) comprises four of said subcompartments (5a).

2. Machine according to claim 1, characterised in that it comprises
30 adjustment means for adapting the dimensions of the housing (2) and/or the positions of said end stop and support elements (3) present therein to different

size articles; and in that said pair of additional partition walls are mobile partition walls (8) actuated by actuating means to move sideways in order to adapt the width of said compartments (5) to different size articles in coordination with said adjustment means, said mobile partition walls (8) being able to move between:

a central position, in which each one divides the respective compartment (5) into two equal subcompartments (5a), each one capable of housing a smaller article (A) and in which said second diverter plates (9) are actuated in order to change position in an alternating manner so as to direct the articles (A) that fall towards one and the other of said subcompartments (5a); and

at least one sideways position, in which each one adapts the width of the respective compartment (5) to a bigger article (A), and in which said pivoting diverter plate (9) remains stationary in a suitable position to direct the article that falls towards said adapted compartment (5).

3. Machine according to claim 2, characterised in that it comprises a series of drop chutes (1) and respective housings (2) joined tangentially along the periphery of a rotary structure (10) the central part of which comprises at least part of said means for loading the articles (A) in the housings (2), with temporary retention means (11) being provided to retain the articles (A) in the housings (2) during a part of the rotating trajectory thereof and letting them fall into their respective drop chutes (1) in one of several drop sections arranged along said rotating trajectory.

4. Machine according to claim 3, characterised in that said temporary retention means (11) have at least one stationary support plane (11) arranged between open bottom walls of the housings (2) and the drop chutes (1), with said stationary support plane (11) being provided with at least four interruptions (12), each one covering one of said fall sections during the rotary trajectory, on which support plane (11) slide articles (A) housed inside the housings (2) until they fall into their respective drop chutes (1) via one of said interruptions (12).

5. Machine according to claim 4, characterised in that it comprises means for selectively stopping some of said interruptions (12) providing a continuation

to the stationary support plane (11) depending on the position of the mobile partition walls (8) in the compartments (5) of the drop chute (1).

6. Machine according to claim 5, characterised in that it comprises four of said interruptions (12) arranged equidistantly along the support plane (11),
5 which is ring shaped, and in that said stopping means comprise two plates (16) which can be placed in two of said interruptions (12), diametrically opposite one another, providing a continuation to the support plane (11) so as to enable the filling of the two compartments (5) of each drop chute (1) during one turn of the rotary structure (10) when the mobile partition walls (8) are in said sideways
10 position, or removed so as to enable the filling of the four subcompartments (5a) of each drop chute (1) during one turn of the rotary structure (10) when the mobile partition walls (8) are in said central position.

7. Machine according to claim 3, characterised in that said adjustment means for adapting the dimensions of each housing (2) and/or the positions of
15 said end stops and support elements (3) comprise two parts (2a, 2b) which delimit in the longitudinal direction each housing (2) and in which said end stop and support elements (3) are arranged, with at least one of said two parts (2a) in each housing (2) being mobile and connected to common actuating means for moving the mobile parts (2a) of all the housings (2) bringing them closer or
20 moving them away from the other parts (2b).

8. Machine according to claim 7, characterised in that each drop chute (1) is delimited in the longitudinal direction by two side walls (1a, 1b), with at least one of said side walls (1a) being made up of a fixed lower portion (17) and a mobile upper portion (18) hinged at one end to the upper end of said fixed
25 portion (17) and linked at the other end to the mobile part (2a) of the corresponding housing (2), so that by adjusting the mobile parts (2a) to different size articles causes a rotation in the mobile upper portions (18) of the side walls (1a) of the drop chutes (1) in order to adjust the dimensions of the mouths thereof in a concurrent manner.

30 9. Machine according to claim 3, characterised in that it comprises position detection means for detecting the angular position of the rotary structure (10) with respect to said drop sections and means for activating said

actuating means of the first and second diverter plates (6, 9) according to the detected angular position of the rotary structure (10).

10. Machine according to claim 3, characterised in that said position detection means are adapted for emitting an electrical or electronic signal that is
5 representative of said detected angular position, which is used to activate said actuating means of the first and second diverter plates (6, 9) according to the detected angular position of the rotary structure (10).

11. Machine according to claim 3, characterised in that said loading means comprise a circular container (13), which is coaxial with the rotary structure (10)
10 and delimited by at least one circumferential side wall (14) and a bottom wall (15) in order to receive a series of articles (A) in a disorderly arrangement, with a ring-shaped opening being provided between a lower edge of said side wall (14) and the periphery of said bottom wall (15) under which slide the housings (2), which have their top faces open, and means for directing said articles (A)
15 towards said ring-shaped opening so that they are introduced into the housings (2) in said flat position, pre-orientated in the longitudinal direction.

12. Machine according to claim 11, characterised in that said means for directing the articles (A) towards the ring-shaped opening have a conical shape for said bottom wall (15) of the container (13), which decreases in height
20 towards the periphery, and actuating means for rotating said bottom wall (15) coaxially with the rotary structure (10) in a direction opposite the rotary direction of said rotary structure.

13. Machine according to claim 3, characterised in that said transfer means comprise one or more deflecting blades (34) for diverting the articles (A)
25 from their rotary trajectory in the drop chutes (1) to a static, curved support track (36), on which slide the articles (A) pushed by a pushing wheel (35) rotated by actuating means until it deposits the articles on exit transport means (7), like a continuous feed belt.

14. Machine according to claim 13, characterised in that said pushing
30 wheel (35) comprises first and second coaxial circular structures (37, 38) and is provided with first and second radial blades (39, 40) attached respectively along

the circumference of said first and second coaxial circular structures (37, 38) in an alternating manner, with means being provided to adjust the relative angular position between both the first and second coaxial, circular structures (37, 38) in order to adapt the separations between said first and second radial blades (39, 40) to different size articles (A), according to the adjustment of the housings (2) and compartments (5).